इंटरनेट मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”
Mazdoor Kisan Shakti Sangathan
“The Right to Information, The Right to Live”

“पुराने को छोड नये के तरफ”
Jawaharlal Nehru
“Step Out From the Old to the New”

IS 7775 (1975): Ceramic grinding media and lining [CHD 9: Ceramicware]

“ज्ञान से एक नये भारत का निर्माण”
Satyanarayan Gangaram Pitroda
“Invent a New India Using Knowledge”

Act Number 22 of 2005
The Indian Parliament
RIGHT TO INFORMATION

Made Available By
Public.Resource.Org

“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”
Bhartṛhari—Nītiśatakam
“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE

BRUTUM FULMEN

IGNORANTIA JURIS NON EXCUSAT

PROTECTED BY COPYRIGHT

IS : 7775 - 1975

Indian Standard
SPECIFICATION FOR
CERAMIC GRINDING MEDIA AND LINING

UDC [621.921:666.3] : 621.926.5

© *Copyright* 1975

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr. 4

October 1975

AMENDMENT NO. 1 JANUARY 2006
TO
IS 7775 : 1975 SPECIFICATION FOR CERAMIC GRINDING MEDIA AND LINING

(*Page* 3, *clause* **2.1,** *line* 2) — Substitute 'IS 2781 : 2004†' *for* 'IS . 2781 - 1961†'.

(*Page* 1, *footnote marked* '†') — Substitute the following for the existing footnote.

'†Glossary of terms relating to ceramicwarc (*second revision)'*

(*Page* 5, *clause* **6.2.1**) — Substitute the following for the existing clause:

'6.2.1 *BIS Certification Mark*

The packages may also be marked with the Standard Mark.

6.2.1.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act,* 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.'

(*Page* 7, *clause* **B-2.2**) — Substitute '*See* IS 5717 : 2003/ISO 3507 : 1999*' *for 'see* IS 5717 - 1960*'.

(*Page* 7, *footnote marked* '*') — Substitute the following for the existing footnote:

'*Laboratory glassware Pyknometers (*second revision*).'

(*Page* 7, *clause* **B-2.5**) - Substitute '*See* IS 1574 : 1980†' *for 'see* IS : 1574 - 1960†.

(*Page* 7, *footnote marked* '†') — Substitute the following for the existing footnote:

'†Specification for glass weighing bottles *(first revision*).'

(*Page* 7, *clause* **B-2.6**) — Substitute 'IS 6128 : 1971‡' *for* 'IS : 6028 - 1971‡'.

Amend No. 1 to IS 7775 : 1975

(*Page* 7, *footnote marked* '‡') — Substitute the following for the existing footnote:

'‡Specification for desiccators.'

(CHD 9)

Reprography Unit, BIS, New Delhi, India

Indian Standard

SPECIFICATION FOR CERAMIC GRINDING MEDIA AND LINING

Ceramicware Sectional Committee, CDC 27

Chairman	*Representing*
DR S. P. VARMA	Directorate General of Technical Development, New Delhi
Members	
ASSISTANT DIRECTOR (MS), RDSO, LUCKNOW	Railway Board (Ministry of Railways)
SHRI G. K. BHAGAT	Bengal Potteries Ltd, Calcutta
SHRI L. S. BHARAJ	Ministry of Defence (R & D)
SHRI N. D. DAVDA	All India Pottery Manufacturers' Association, Calcutta
SHRI S. K. GHOSH (*Alternate*)	
SHRI S. DEB	Associated Porcelain Pvt Ltd, Calcutta
DR S. P. SINGH DHAKAREY	Ministry of Defence (DGI)
SHRI SARAD ATHWALE (*Alternate*)	
SHRI M. K. GANPULE	The Parshuram Pottery Works Co Ltd, Wankaner
SHRI R. R. DEO (*Alternate*)	
SHRI NARIMAN KISHKO	Federation of Hotel & Restaurant Associations of India, New Delhi
SHRI RAM PERSHAD (*Alternate*)	
SHRI R. V. LELE	Central Glass & Ceramic Research Institute (CSIR), Calcutta
SHRI R. M. MEHRA	Bombay Potteries & Tiles Ltd, Bombay
SHRI D. P. NIYOGI	Sur Enamel & Stamping Works Pvt Ltd, Calcutta
SHRI PRONOB KUMAR SUR (*Alternate*)	
SHRI T. C. K. PILLAI	Kerala Ceramics Ltd, Kundara
SHRI N. KARUNAKARAN (*Alternate*)	
SHRI E. K. RAMACHANDRAN	National Test House, Calcutta
SHRI G. C. DAS (*Alternate*)	
SHRI P. JAGANATH RAO	E.I.D-Parry Ltd, Ranipet
DR B. N. SAMADDAR	Government of West Bengal
DR B. M. SEDALIA	Development Commissioner (Small Scale Industries), New Delhi
SHRI P. SUR	Vitreous Enamellers' Association, Calcutta
DR G. M. SAXENA, Director (Chem)	Director General, ISI (*Ex-officio Member*)

Secretary

SHRI G. P. SARASWAT
Deputy Director (Chem), ISI

(*Continued on page* 2)

© *Copyright* 1975
INDIAN STANDARDS INSTITUTION

This publication is protected under the *Indian Copyright Act* (XIV of 1957) and reproduction in whole or in part by any means except with written permission of the publisher shall be deemed to be an infringement of copyright under the said Act.

(*Continued from page* 1)

Ceramic Whiteware Subcommittee, CDC 27 : 2

Convener	*Representing*
SHRI R. V. LELE	Central Glass & Ceramic Research Institute (CSIR), Calcutta
Members	
SHRI K. K. BHATIA	U. P. Ceramics & Potteries Ltd, Ghaziabad
SHRI K. P. KAPUR *(Alternate)*	
SHRI D. S. CHABHAL	Directorate General of Technical Development, New Delhi
SHRI S. DEB	Associated Porcelain Pvt Ltd, Calcutta
SHRI R. R. DEO	The Parshuram Pottery Works Co Ltd, Wankaner
SHRI D. A. SHAH (*Alternate*)	
SHRI P. G. DUTTA	B. D. Ceramics Pvt Ltd, Calcutta
SHRI S. K. GHOSH	India Potteries Ltd, Calcutta
SHRI S. C. SEN GUPTA (*Alternate*)	
SHRI P. C. KAPUR	Directorate General of Health Services, New Delhi
SHRI B. KUMAR	Kumar Manufacturing Co, Howrah
SHRI SUSHIL RAY (*Alternate*)	
DR V. P. MAHESHWARY	Development Commissioner (Small Scale Industries), New Delhi
SHRI L. RANGANATHAN	Carborundum Universal Ltd, Madras
SHRI P. K. B. ROY (*Alternate*)	
SHRI S. RANGARAJAN	National Physical Laboratory (CSIR), New Delhi
SHRI P. JAGANATH RAO	E.I.D-Parry Ltd, Ranipet
SHRI A. K. SARKAR (*Alternate*)	
DR N. VENKATARAMAN	Indian Aluminium Co Ltd, Calcutta
SHRI A. CHATTERJEE (*Alternate*)	

Indian Standard

SPECIFICATION FOR CERAMIC GRINDING MEDIA AND LINING

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 14 August 1975, after the draft finalized by the Ceramicware Sectional Committee had been approved by the Chemical Division Council.

0.2 Ceramic grinding media are widely used in ceramic, cement, cosmetics, paint and chemical industries for fine grinding of materials in ball mills, tube mills, compound mills, etc. Similarly, ceramic lining is used in big size ball mills to prevent contamination of batch with iron. Therefore, careful selection of grinding media and lining is an essential precondition for guaranteeing purity of the ground material. This standard provides useful guidance in the selection of ceramic grinding media and lining.

0.3 This standard contains clauses **4.3.2** and **6.1** which provide for agreement between the purchaser and the supplier.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard prescribes requirements and methods of sampling and test for ceramic grinding media and lining for ball mills and cylinders used for grinding purposes.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 2781-1961† shall apply.

---

*Rules for rounding off numerical values (*revised*).

†Glossary of terms relating to ceramicware.

3. TYPES

3.1 Grinding Media — There shall be two types of grinding media, namely, Type A Spherical, and Type B Cylindrical.

3.2 Lining — There shall be two types of lining, namely, Type A Side tapering plain, and Type B Side tapering having tongue and groove arrangement.

4. REQUIREMENTS

4.1 Material — Ceramic grinding media and lining shall be made of dense, homogeneous ceramic body having high mechanical strength and abrasion resistance.

4.2 Workmanship and Finish

4.2.1 *Grinding Media* — Grinding media shall be unglazed, regular in shape and free from cracks, and reasonably free from specks and other visual defects. In the case of cylindrical shape, the edges shall be rounded smooth.

4.2.2 *Lining* — Lining shall be free from cracks, specks and other visual defects. The sides along the length forming the taper shall be plain in Type A and with tongue and groove providing a close fit in Type B.

4.3 Dimensions

4.3.1 *Grinding Media*

4.3.1.1 Spherical grinding media shall be of diameters 10, 15, 20, 25, 30, 40, 50, 60 and 80 mm.

4.3.1.2 Cylindrical grinding media shall be of sizes (height × diameter) 12.5 × 12.5 mm and 25 × 25 mm.

4.3.1.3 Tolerances on dimensions shall be not more than 5 percent and not less than 1 mm on any size.

4.3.2 Lining shall be of sizes as agreed to between the purchaser and the supplier.

5. TESTS

5.1 Hardness — Grinding media and lining shall have hardness not less than 6 on Moh's scale.

5.2 Water Absorption — Water absorption of the body of the grinding media and lining, when tested in accordance with the method prescribed in Appendix A, shall not exceed 0.3 percent by mass.

5.3 True Relative Density — True relative density of the body of the grinding media and lining, when tested in accordance with the method prescribed in Appendix B, shall be between 1.7 and 2.0.

5.4 Modulus of Rupture — Modulus of rupture of specimens prepared from the same body as that of the grinding media and lining and fired along with them, when tested in accordance with the method prescribed in Appendix C, shall not be less than 496.0 kgf/cm^2.

NOTE — 1 kgf/cm^2 = 10^5 Pascals = 10^5 N/m^3.

5.5 Abrasion Resistance — Abrasion resistance of specimens prepared from the same body as that of grinding media and lining and fired along with them, when tested in accordance with the method prescribed in Appendix D, shall not exceed 1.02 ml/h.

6. PACKING AND MARKING

6.1 Packing — Grinding media and lining shall be packed as agreed to between the purchaser and the supplier.

6.2 Marking — The packages shall be marked with the following:

a) Name of the material;
b) Type, size and shape; and
c) Name of the manufacturer or his recognized trade-mark, if any.

6.2.1 The packages may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

7. SAMPLING

7.1 Representative samples of grinding media and lining shall be drawn and adjudged as prescribed in Appendix E.

APPENDIX A

(*Clause* 5.2)

METHOD OF TEST FOR WATER ABSORPTION

A-1. TEST PIECES

A-1.1 Test pieces shall be freshly broken from the body of the grinding media or lining. They shall be free from sharp corners, friable edges, loose dust and skin. At least three pieces or groups of pieces shall be taken for the test, and the mass of each piece or group of pieces shall be between 50 and 100 g.

A-2. PROCEDURE

A-2.1 Dry the test pieces in an air-oven maintained at a temperature between 105 and 110°C and then cool to room temperature in a desiccator to a constant mass. Weigh the pieces accurately nearest to 0.01 g. Immerse the test pieces in water and boil for 2 hours. During the boiling period test pieces shall be kept entirely covered with water and shall not be allowed to come in contact with the sides of the vessel. After the boiling period, cool the test pieces to room temperature while still completely covered with water. Allow them to remain under water at room temperature for at least 3 hours. Remove the test pieces from water, wipe with a wet cloth to remove all drops of water from the surface and reweigh quickly nearest to 0.01 g.

A-3. CALCULATION

A-3.1 Water absorption, percent by mass = $\frac{M_1 - M}{M} \times 100$

where

M_1 = mass in g of the test pieces after treatment, and

M = mass in g of the dry test pieces.

A-3.1.1 All the 3 pieces or groups of pieces shall show water absorption not exceeding 0.3 percent by mass.

APPENDIX B

(*Clause* 5.3)

DETERMINATION OF TRUE RELATIVE DENSITY

B-1. MATERIAL FOR TEST

B-1.1 Cut or break pieces from the sample so that any part of the original surface (skin) is excluded. Crush the pieces between hardened steel surfaces to a maximum particle size of 3 mm. Thoroughly mix the crushed material and reduce by quartering to a test sample of 25 g.

B-1.2 Grind the entire 25 g of sampled material in an agate mortar to such a fineness that it will pass through 75-micron IS Sieve. Remove by a magnet any magnetic material introduced in crushing or grinding. Take care at all stages of preparation of the test sample not to exclude any portions that are difficult to grind. Avoid introduction of any impurity.

B-2. APPARATUS

B-2.1 Analytical Balance and Weights

B-2.2 50-ml Pyknometer, Type 5 — *see* IS : 5717-1960*.

B-2.3 Thermometer

B-2.4 Drying Oven

B-2.5 Weighing Bottle — *see* IS : 1574-1960†.

B-2.6 Desiccator — *see* Type 1 of a suitable size in IS : 6028-1971‡.

B-3. PROCEDURE

B-3.1 Clean and dry the pyknometer at 105 to 110°C, cool in a desiccator and weigh it empty (M_1). Then fill the pyknometer with distilled water at room temperature (t°C) to give a convex meniscus, and carefully insert the stopper so that excess water leaves by way of the capillary. Remove excess water leaking from the stopper with a piece of filter paper, dry externally and weigh again (M_2). Then empty the pyknometer and dry.

B-3.2 Place approximately 8 to 12 g of the dried test material in the pyknometer, stopper and weigh (M_3). Fill the pyknometer to one-fourth to one-half of its capacity with distilled water, and boil the water (*see* Note 1) at atmospheric or reduced pressure for approximately 10 to 15 minutes. After boiling, fill the pyknometer with distilled water (*see* Note 2), cool to room temperature (t°C) in a water bath, insert the stopper, wipe off excess water from the stopper and dry the pyknometer thoroughly with a lintless towel. Then weigh the pyknometer and contents (M_4). Make duplicate tests on material and record all weighings to the nearest 0.000 1 g.

NOTE 1 — Exercise caution during boiling so that it is not sufficiently vigorous to cause loss of the test material due to popping. If the boiling is done at atmospheric pressure, it is advisable to insert with the stopper a thin strip of paper before the boiling operation.

NOTE 2 — Fill the pyknometer so that there is an overflow of water through the capillary tube when the stopper is inserted. When wiping excess water from the tip of the stopper, do it in such a way as not to withdraw any water from the capillary tube. Any variation in room temperature (t°C) when obtaining mass (m_2) and (m_4) will introduce an appreciable error. Therefore, obtain them at the same temperature within the limits of ± 0.3°C. Use a bath controlled to ± 0.1°C.

---

*Specification for pyknometers.

†Specification for glass weighing bottles.

‡Specification for desiccators.

B-4. CALCULATION

B-4.1 Calculate the relative density in accordance with the following formula:

$$\text{Relative density} = \frac{M_3 - M_1}{(M_2 - M_1) - (M_4 - M_3)}$$

where

M_1 = mass in g of the stoppered pyknometer,

M_2 = mass in g of the stoppered pyknometer filled with water,

M_3 = mass in g of the stoppered pyknometer and test material, and

M_4 = mass in g of the stoppered pyknometer, test material and water.

B-4.2 Determine the true relative density of the test material without additional measurement in accordance with the following formula:

$$\text{True density} = \text{relative density} \times (d_w - d_a) + d_a$$

where

d_w = density of water at t°C, the temperature at which the test was carried out; and

d_a == density of air at t°C, the temperature at which the test was carried out.

APPENDIX C

(*Clause* 5.4)

DETERMINATION OF MODULUS OF RUPTURE

C-1. TEST PIECES

C-1.1 Test pieces shall be unglazed uniform cylinders approximately 100 mm long and 15 ± 1 mm in diameter. They shall be as free as practicable from visual defects, such as cracks, pits, etc. Test shall be carried out on not less than 6 and not more than 10 test pieces.

C-2. APPARATUS

C-2.1 The essential requirements of a suitable apparatus are illustrated in Fig. 1. It comprises of the following:

a) Two V-edge supports, approximately 75 mm apart, rounded at the edge to an arc of 0.2 mm radius each covered with a 2 mm layer of lead foil; and

b) A presser foot with a V-edge rounded to an arc of 0.2 mm radius and covered with a 2 mm layer of lead foil, for the purpose of enabling a load to be applied midway between the supports.

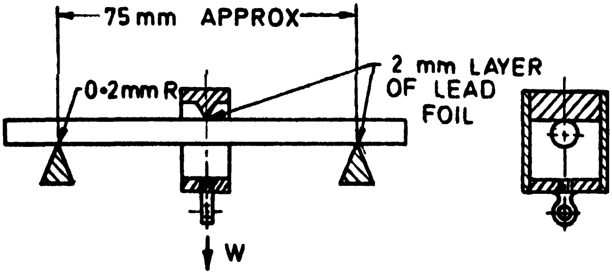


FIG. 1 APPARATUS FOR DETERMINATION OF MODULUS OF RUPTURE

C-3. PROCEDURE

C-3.1 Place the test piece centrally on the V-edge supports, and apply the load by the use of presser foot to the mid-point of the test piece, at a uniform rate of 90 N/min* by flowing lead shots into a pan transmitting its load to the pressure foot. Stop the load increase immediately the test piece breaks. Note the breaking load and calculate the modulus of rupture from the following formula:

$$\text{Modulus of rupture} = \frac{8WL}{\pi D^3} \times 10^6 \text{ N/m}^2$$

where

W = breaking load in N,

L = distance between supports in mm, and

D = mean diameter of test pieces in mm.

C-4. EXPRESSION OF RESULTS

C-4.1 Calculate the mean modulus of rupture of the specimens tested. Reject any result differing from this mean by more than 25 percent and calculate the new mean from all the remaining results, which shall be not less 4 in number. Record this new mean as the modulus of rupture of the material, together with the standard deviation of the results from which the new mean is calculated.

APPENDIX D

(*Clause* 5.5)

DETERMINATION OF RESISTANCE TO ABRASION

D-1. TEST PIECES

D-1.1 Test pieces shall be in the form of unglazed tiles 150 × 100 × 25 mm in size. Test shall be carried out on one tile. A separate tile will be required for determination of bulk density.

---

*1 kgf = 9.806 65 newton (N).

D-2. APPARATUS

D-2.1 A suitable apparatus is illustrated in Fig. 2. It consists of a frame into which the test piece is fitted. Means are provided to give a reciprocating motion to the frame by means of suitable gear driven by an electric motor of not less than 200 W output. The frequency of oscillations shall be 30 per minute (0.5 Hz) and the amplitude 69 mm. A cast iron pan having a slot in the bottom, and held in a separate frame, rests on the test piece. The pan weighs 5 ± 0.5 kg.

D-3. PROCEDURE

D-3.1 Weigh the test piece to the nearest 0.1 g and secure firmly to the frame. Place the cast iron pan over the test piece and fill it with silicon carbide powder (passing through 710-micron IS sieve and retained on 500-micron IS sieve). Maintain between 700 to 900 g of this powder in the pan throughout the test.

D-3.1.1 Set in motion the frame holding the test piece and record the time. After one hour stop the machine, remove the test piece and weigh to the nearest 0.1 g. Repeat this process for eight hourly periods. After each period sieve the silicon carbide powder through 500-micron IS sieve and reuse only that retained on it; at the same time make up for the fines passing through the sieve.

D-3.1.2 Carry out a bulk density determination on the second test piece.

D-4. ASSESSMENT OF RESULTS

D-4.1 Disregard the abrasion loss during the first hour because the original surface of test piece may not be plane and the losses during the period may not relate directly to the whole area of surface. Divide subsequent losses in grams by the bulk density of the test piece and express the abrasion loss in terms of millilitres per hour. It may be advantageous to plot curves showing abrasion loss against time.

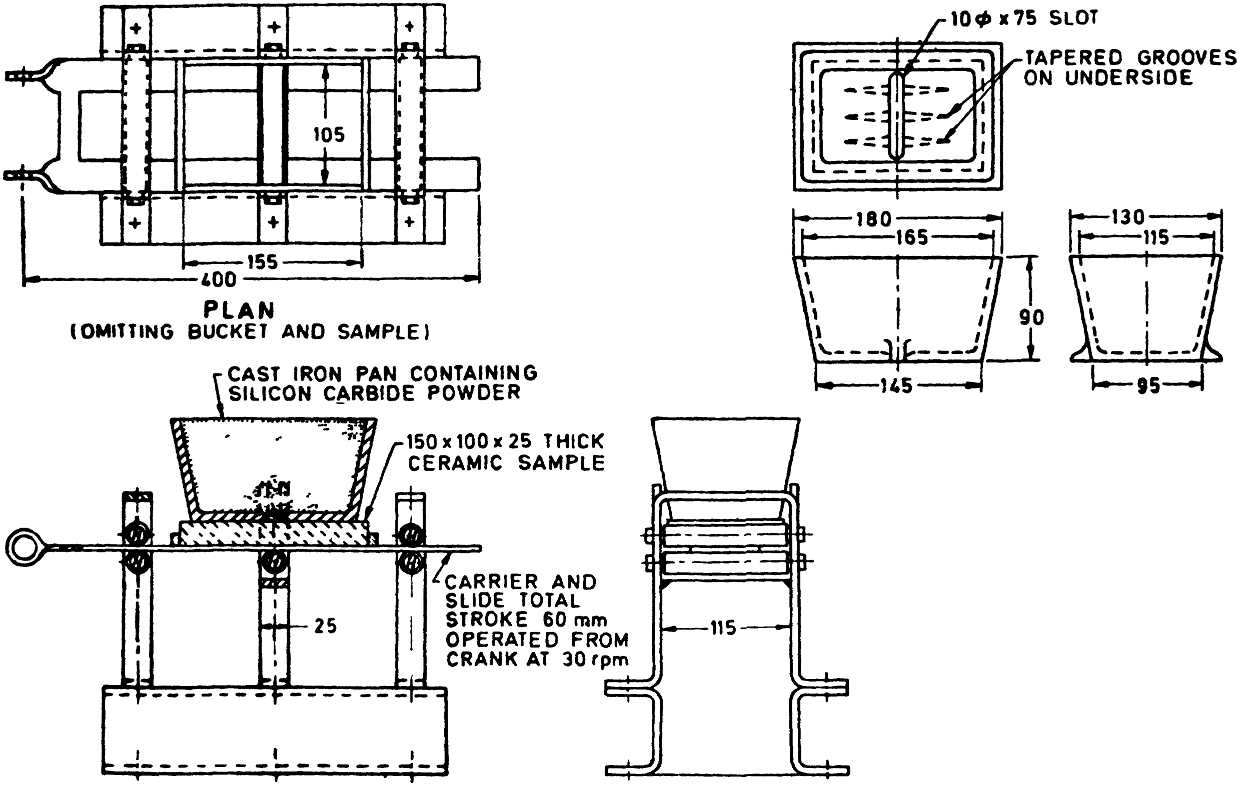
APPENDIX E

(*Clause* 7.1)

SAMPLING OF CERAMIC GRINDING MEDIA AND LINING

E-1. SCALE OF SAMPLING

E-1.1 Lot — In any consignment all packages of material of the same type and size manufactured from the same material under relatively


10 ϕ x 75 SLOT
TAPERED GROOVES ON UNDERSIDE
180
165
90
145
130
115
95
105
155
400
PLAN
(OMITTING BUCKET AND SAMPLE)
CAST IRON PAN CONTAINING SILICON CARBIDE POWDER
150 x 100 x 25 THICK CERAMIC SAMPLE
CARRIER AND SLIDE TOTAL STROKE 60 mm OPERATED FROM CRANK AT 30 rpm
25
115

All dimensions in millimetres.

FIG. 2 ARRANGEMENT FOR DETERMINATION OF RESISTANCE TO ABRASION

similar conditions of manufacture shall be grouped together to constitute a lot. If a consignment is known to consist of packages of different sizes or different types or different batches of manufacture, the packages belonging to the same size, same type and same batch shall be grouped together and each such group shall constitute a lot.

E-1.2 For ascertaining the conformity of the lot to the requirements of the specification, tests shall be carried out for each lot separately.

E-1.3 The number of grinding media/lining to be selected for this purpose shall depend on the size of the lot and shall be in accordance with Table 1.

TABLE 1 SCALE OF SAMPLING AND PERMISSIBLE NUMBER OF DEFECTIVES

(*Clauses* E-1.3, E-2.1 *and* E 2.2)

LOT SIZE	FOR VISUAL AND DIMENSIONAL CHARACTERISTIC (4.1 TO 4.3)		No. OF TESTS FOR EACH OF THE CHARACTERISTICS OTHER THAN VISUAL DIMENSIONAL (5.1 TO 5.5)
	Grinding Media/Lining to be Selected	Permissible No. of Defectives	
(1)	(2)	(3)	(4)
(N)	(*n*)		
Up to 100	13	1	1
101 „ 300	20	2	2
301 „ 500	32	3	3
501 „ 1 000	50	5	4
1 001 ,, 3 000	80	7	5
3 001 ,, 5 000	125	10	6
500 1 and above	200	14	7

E-1.3.1 These packages shall be selected at random from the lot and to ensure the randomness of selection, procedures given in IS : 4905-1968* may be followed. At least 25 percent of the packages shall be sampled ana approximately equal number of pieces taken from each selected package so as to constitute the required sample size.

---

*Methods for random sampling.

E-2. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

E-2.1 Tests for Visual and Dimensional Characteristics — The pieces selected according to **E-1.3.1** shall be examined for visual and dimensional characteristics (*see* **4.1, 4.2** and **4.3**). Any grinding media/ lining failing to satisfy any one or more of these requirements shall be considered as defective. The lot shall be considered as conforming to the requirements for these characteristics if the number of defective grinding media/lining in the sample does not exceed the corresponding number given in col 3 of Table 1.

E-2.2 Characteristics Other Than Visual and Dimensional (**5.1 to 5.5**) — If the lot conforms to the requirements for visual and dimensional characteristics, sufficient number of grinding media/lining shall be taken to conduct the number of tests, given in col 4 of Table 1 for each of these characteristics. These may be selected from those already tested and found satisfactory under **E-2.1.** The lot shall be considered as conforming to these requirements if no failure occurs.

E-2.3 The lot shall be declared as conforming to the requirements of the specification if **E-2.1** and **E-2.2** are satisfied.

INDIAN STANDARDS ON CERAMICWARE

IS:	
2717-1964	Glossary of terms used in vitreous enamelware industry
2781-1964	Glossary of terms relating to ceramicware
2836-1974	Methods of test and quality requirement for porcelain laboratory apparatus *(first revision)*
2837-1964	Porcelain crucibles and basins
2838-1964	Stoneware containers for general purposes
2839-1964	Industrial stoneware
2840-1965	China clay for ceramic industry
2857-1964	Earthenware dinnerware
3149-1968	Enamelware for home use *(first revision)*
3432-1965	Clay pipe triangles
3505-1965	Porcelain dinnerware
3936-1966	Porcelain mortars and pestles
3953-1966	High temperature combustion boats
3972-1968	Methods of test for vitreous enamelware
3990-1967	Combustion tubes
4589-1968	Ball clays for ceramic industry
5009-1968	Buchner funnels
5011-1968	Gooch crucibles
6154-1971	Perforated plates for desiccators
6988-1973	Fine china dinnerware
7087-1973	Ceramic tower packings
7402 (Part I)-1974	Ceramic water filters: Part I Filter containers
7402 (Part II)-1975	Ceramic water filters: Part II Filter candles

PUBLICATIONS OF INDIAN STANDARDS INSTITUTION

INDIAN STANDARDS

Over 8 000 Indian Standards covering various subjects have been Issued so far. Of these, the standards belonging to the Chemical Group fall under the following categories:

- Acids
- Adhesives
- Alcohols and allied products
- Alkalis
- Brushware
- Ceramicware, enamelware and laboratory porcelain
- Chemical hazards and safety
- Chemicals, inorganic (miscellaneous)
- Chemicals, organic (miscellaneous)
- Coal and coke
- Coal carbonization products
- Coated fabrics
- Cosmetics and toilet goods
- Dental materials
- Drying oils
- Dye intermediates
- Electroplating chemicals
- Explosive and pyrotechnic materials
- Fertilizers
- Fillers, stoppers and putties
- Footwear
- Glass and glassware
- Industrial gases
- Inks and allied products
- Laboratory glassware thermometers and related apparatus
- Lac and lac products
- Leather, leather goods and leather dressings
- Linters and allied products
- Lubricants and related products
- Oil pastes
- Oils & fats, oleaginous seeds and fruits
- Painters' materials (miscellaneous)
- Paper and its products
- Paper and pulp board packaging materials
- Perfumery materials, natural and synthetic
- Petroleum and petroleum products
- Photographic chemicals
- Pigments and extenders
- Plastics
- Polishes
- Printing Inks
- Ready mixed paints and enamels
- Rubber and rubber products
- Soaps and other surface active agents
- Tanning materials and allied products
- Thermal insulation materials
- Thinners and solvents
- Varnishes and lacquers
- Water and water treatment
- Water based paints
- Unclassified

OTHER PUBLICATIONS

ISI Bulletin (Published Every Month)	
Single Copy	Rs 4.00
Annual Subscription	Rs 36.00
Standards: Monthly Additions	
Single Copy	Re 0.30
Annual Subscription	Rs 5.00
Annual Reports (from 1948-49 Onwards)	Rs 2.00 to 6.00
ISI Handbook, 1975	Rs 30.00

INDIAN STANDARDS INSTITUTION

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002

Telephone : 27 01 31 (20 lines) Telegrams : Manaksanstha

Regional Offices:

			Telephone
Western :	Novelty Chambers, Grant Road	BOMBAY 400007	37 97 29
Eastern :	5 Chowringhee Approach	CALCUTTA 700072	23-08 02
Southern :	54 General Patters Road	MADRAS 600002	8 37 81

Branch Offices:

'Pushpak', Nurmohamed Shaikh Marg, Khanpur	AHMEDABAD 380001	2 03 91
'F' Block, Unity Bldg, Narasimharaja Square	BANGALORE 560002	2 76 49
Kothi No. 90, Sector 18A	CHANDIGARH	2 83 20
5-8-56/57 Nampally Station Road	HYDERABAD 500001	4 57 11
117/418 B Sarvodaya Nagar	KANPUR 208005	82 72
B.C.I. Bldg (Third Floor), Gandhi Maiden East	PATNA 800004	2 56 55

Printed at Printograph, New Delhi, India